



Fact Sheet

NPDES Permit Number: AK-000084-1

Date: April 18, 2000

Public Notice Expiration Date: May 18, 2000

**Contact: Ben Cope (206) 553-1442 or
1-800-424-4372 (within Region 10 only)
cope.ben@epa.gov**

**The U.S. Environmental Protection Agency (EPA)
Plans to Reissue the Wastewater Discharge Permit for:**

**Tesoro Alaska Petroleum Company
P.O. Box 3369
Kenai, Alaska 99611**

and

**The State of Alaska
Plans to Certify that the Permit Complies with:**

- (1) Alaska Water Quality Standards; and**
- (2) Alaska Coastal Management Requirements**

EPA Proposes NPDES Permit Reissuance.

EPA proposes to reissue the existing National Pollutant Discharge Elimination System (NPDES) permit for Tesoro Alaska Petroleum Company. The draft permit sets conditions on the discharge--or release--of pollutants from the Tesoro facility to Cook Inlet near Port Nikiski.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current discharge
- a listing of proposed effluent limitations and other conditions
- a map and description of the discharge location
- detailed background information supporting the conditions in the permit

The State of Alaska proposes certification.

The Alaska Department of Environmental Conservation (ADEC) proposes to certify the NPDES permit for the Tesoro Refinery under section 401 of the Clean Water Act.

The State of Alaska proposes a consistency finding.

The State of Alaska, Office of Management and Budget, Division of Governmental Coordination (DGC), proposes a finding of consistency with the Alaska Coastal Management Program.

EPA Invites Comments on the Draft Permit.

EPA will consider all substantive comments before issuing a final permit. Persons wishing to comment on the tentative determinations contained in the proposed permit or wishing to request that a public hearing be held, may do so in writing to the address below:

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
Attn: Ben Cope

Comments may also be submitted electronically to Ben Cope at “cope.ben@epa.gov”.

After the comment period closes and all comments have been considered, EPA’s regional Office of Water Director will make a final decision regarding permit issuance.

If no substantive comments are received on the proposed permit, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit along with a response to comments. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

EPA will hold a public hearing on the draft permit in the Kenai area if there is sufficient public interest. Persons interested in requesting a public hearing on the draft permit should submit written requests to EPA by the close of the comment period. If there is sufficient public interest in a hearing, the comment period will be extended to allow time for a hearing. Details about the time and location of the hearing would be provided in a separate notice.

Persons wishing to comment on State Certification should submit written comments before the public notice expiration date to: Alaska Department of Environmental Conservation, Division of Air and Water Quality, P.O. Box 1709, Valdez, Alaska 99686.

Documents Are Available for Review.

The draft NPDES permit and related documents can be reviewed at EPA’s Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday. To request copies and other information, contact the NPDES Permits Unit at:

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-1442 or
1 (800) 424-4372 (within Region 10 only)

The fact sheet and draft permit are also available at:

EPA Alaska Operations Office
222 W. 7th Ave #19
Anchorage, Alaska 99513-7588

Alaska Department of Environmental Conservation
Division of Air and Water Quality
P.O. Box 1709
Valdez, Alaska 99686

The draft permit and fact sheet can also be found by visiting the Region 10 web site at **www.epa.gov/r10earth/water.htm**.

For technical questions regarding the permit or fact sheet, contact Ben Cope at the phone numbers or email address at the top of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384. Ask to be connected to Ben Cope at the above phone numbers.

TABLE OF CONTENTS

I.	APPLICANT	5
II.	FACILITY ACTIVITY	5
III.	RECEIVING WATER	6
IV.	PERMIT BACKGROUND	6
V.	EFFLUENT LIMITATIONS	6
VI.	MONITORING REQUIREMENTS	9
	A. Effluent Monitoring	9
	B. Whole Effluent Toxicity Testing	9
	C. Sediment Monitoring	10
	D. Quality Assurance Plan	11
VII.	BEST MANAGEMENT PRACTICES	11
VIII.	OTHER PERMIT CONDITIONS	12
IX.	OTHER LEGAL REQUIREMENTS AND CONSIDERATIONS	12
	A. Endangered Species Act	12
	C. Essential Fish Habitat	13
	D. State Certification	14
	E. Coastal Zone Management Act (CZMA)	14
	F. Permit Term	14
APPENDIX A:	Tesoro Facility Map	16
APPENDIX B:	Tesoro Waste Streams and Treatment Processes	18
APPENDIX C:	Basis for Effluent Limitations	19
APPENDIX D:	Ammonia Limit Calculations	28
APPENDIX E:	Basis for Remediation Wastewater Limit on Benzene	32
APPENDIX F:	Essential Fish Habitat (EFH) Assessment	33

I. APPLICANT

Tesoro Alaska Petroleum Company NPDES Permit No: AK-000084-1

Mailing Address:
P.O. Box 3369
Kenai, AK 99611

Facility Location:
Mile 22 Kenai Spur Hwy
Kenai, AK 99611

Contact: Robert Napier, Environmental Compliance Administrator

II. FACILITY ACTIVITY

Tesoro Alaska Petroleum Company owns and operates a refinery in Kenai, Alaska. The refinery receives crude from Cook Inlet and Alaska North Slope oil fields, and it has a rated processing capacity of 72,000 barrels of crude per day.

Crude oil is delivered by tankers and pumped into storage tanks. It is piped to the crude unit where the following petroleum products are separated: fuel gas, liquified petroleum gas (LPG), fuel oil, naphtha, light gas run, diesel, and gas oil. LPG, naphtha, gas oil, and light gas run are then fed through the LPG unit, reformer unit, hydrocracker unit, vacuum unit, and isomerization unit to produce more refined products such as propane, butane, fuel gas, reformate, jet-A fuel, and isomerate. The facility also produces asphalt in the summer months.

Wastewaters from the refining process are treated in a multi-step process prior to discharge to Cook Inlet. A detailed listing of the waste streams and treatment processes is included in Appendix B. During the permit development process, Tesoro notified EPA that it is committing resources to design and install a new treatment process to remove dioxin from its catalyst regeneration wastestream (see additional discussion in Appendix C).

Tesoro also operates a remediation system for on-site, contaminated groundwater. Groundwater contaminated with petroleum products is pumped to an air-stripping system to remove volatile hydrocarbons. Tesoro has applied to discharge the majority of treated wastewater along with refinery wastewaters to Cook Inlet. The remainder is to be discharged to a trench system (for infiltration back to groundwater). The remediation system is authorized by a RCRA Part B permit and a state infiltration permit. The remediation wastewater discharge to Cook Inlet is authorized in this NPDES permit.

The facility is designed to receive ballast water from vessels. The current permit for Tesoro authorized the discharge of treated ballast water. However, no ballast water has been received during the last permit term, and Tesoro is not requesting continued authorization of this discharge.

III. RECEIVING WATER

Tesoro discharges to Cook Inlet through a single 8-inch diameter outfall, terminating approximately 700 feet offshore from the mean lower low water (MLLW) shoreline near Port Nikiski. The discharge is at latitude 60E 40' 42" N, and longitude 151E 23' 38" W. A map of the facility and outfall location is included in Appendix A of this fact sheet.

The area to which Tesoro discharges is in the vicinity of a feature of Cook Inlet called the Forelands. Sediment sampling and grain size was performed on the substrate in the vicinity of West Forelands (Minerals Management Service, 1995). Results of this study indicate that the substrate is more than 90 percent sand in this area. No data on sediment grain size were available for the area near Port Nikiski.

Cook Inlet has been classified by the Alaska Department of Environmental Conservation (ADEC) as marine waters with water use classes 2A through 2D (water supply; water recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life).

IV. PERMIT BACKGROUND

EPA issued the current National Pollutant Discharge Elimination System (NPDES) permit for Tesoro on March 19, 1991, with a five year term. On September 28, 1995, Tesoro submitted a timely NPDES permit application for reissuance. The current permit expired on April 17, 1996.

Because Tesoro submitted a timely application for reissuance, the company is authorized to continue discharging under the terms of its expired permit until a new permit is issued and effective (40 CFR 122.6).

Tesoro has made process changes at the refinery during the last permit term. Tesoro added a vacuum unit in December 1994, commenced seasonal asphalt production in June 1996, and expanded the hydrocracker unit in October 1997. These changes affect some of the effluent limitations for the facility.

V. EFFLUENT LIMITATIONS

EPA followed the Clean Water Act, State and federal regulations, and EPA's 1991 *Technical Support Document for Water Quality-Based Toxics Control* to develop the proposed effluent limits. In general, the Clean Water Act requires

that the effluent limit for a particular pollutant be the more stringent of either the technology-based or water quality-based limit.

EPA sets technology-based limits based on the effluent quality that is achievable for a particular industry using readily available technology. EPA develops these limits based either on federally-promulgated effluent guidelines or, where such guidelines have not been promulgated for an industry, based on best professional judgement.

The Agency evaluates the technology-based limits to determine whether they are adequate to ensure that water quality standards are met in the receiving water. If the limits are not adequate, EPA must develop additional water quality-based limits. These limits are designed to prevent exceedences of the Alaska water quality standards in Cook Inlet.

Table 1 compares the proposed effluent limits in the draft permit with those in the 1991 permit. The technical basis for the effluent limits is provided in Appendix C. The table also lists the maximum daily and maximum monthly-average discharges from Tesoro's Discharge Monitoring Reports in the last two years (January 1998 to August 1999), except where otherwise noted. Based on past performance, the table indicates that the discharge from the Tesoro facility should be able to comply with the proposed limitations.

Table 1: Effluent Limitations and Reported Discharges						
Parameter	Effluent Limitations					
	Maximum Daily			Monthly Average		
	1991 Permit	Draft Permit	Reported Discharge	1991 Permit	Draft Permit	Reported Discharge
Five Day Biochemical Oxygen Demand (BOD ₅ , lb/day) ¹	371	314	240	204	173	147
Total Suspended Solids (TSS, lb/day)	261	261	223	166	166	159
Oil and Grease (O&G, lb/day)	87	67	71	48	38	29
Chemical Oxygen Demand (COD, lb/day)	2465	2002	738	1320	1084	738
Ammonia as N (NH-N, lb/day)	190	143	171 ¹	86	65	82 ¹
Ammonia as N (NH-N, mg/l)	---	100	59 ^{1,2}	---	43	10 ^{1,2}
Sulfide (lb/day)	2.42	2.05	.32	1.08	0.91	.10
Phenolic Compounds (lb/day)	1.34	1.34	.34	0.62	0.62	.12
Total Chromium (Cr, lb/day)	2.43	2.43	ND ³	1.29	1.29	ND ³
Hexavalent Chromium (Cr ⁺⁶ , lb/day)	0.19	0.19	ND ³	0.10	0.10	ND ³
pH	6.5 - 9.0	6.5 - 9.0	7.3 - 8.7	---	---	---
Total Aromatic Hydrocarbons (TAH, ug/l)	400	---	67 ⁴	---	---	---
Benzene (ug/l) - Outfall 001B	---	5.0	4.5 ⁴	---	---	---

Table 1: Effluent Limitations and Reported Discharges**Footnotes**

- (1) Ammonia discharges are expected to be reduced in the future as a result of recent improvements in the operation of the sour water stripper (see discussion below).
 (2) Maximum measured ammonia at outfall 001 (from Tesoros's acute mixing zone submittal)
 (3) "ND" means not detected
 (4) Estimated maximum discharge from Tesoro's NPDES permit application update (11/09/99)

VI. MONITORING REQUIREMENTS**A. Effluent Monitoring**

Section 308 of the Clean Water Act and the federal regulations at 40 CFR 122.44(i) require that permits include monitoring to determine compliance with effluent limitations. Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. Tesoro is responsible for conducting the monitoring and for reporting the results to EPA on monthly Discharge Monitoring Reports (DMRs).

B. Whole Effluent Toxicity Testing

The 1991 permit required Tesoro to conduct quarterly whole effluent toxicity testing for sublethal effects using sea urchins or sand dollars, and twice per year testing for acute effects using juvenile salmonids. The Alaska water quality standards contain requirements for whole effluent toxicity, and EPA has reviewed the most recent 20 tests conducted by Tesoro to evaluate the need for new permit requirements for toxicity.

	Endpoint Reported	Minimum Reported ¹	Maximum Reported ¹	Number of Samples
Acute	LC50	38.6%	>100%	20
Chronic	NOEC	8.8%	70%	20

Note:

- 1 The "minimum reported" value is actually the highest degree of toxicity. The value reported is the percentage of effluent (diluted with clean laboratory water) at which an acute or chronic effect to the organism was observed.

The data for chronic toxicity indicate that the discharge has no reasonable potential to exceed State water quality standards at the proposed mixing zone boundary (with a dilution of 56:1, which equates to 1.8% effluent). Therefore, the draft permit contains no limits on chronic whole effluent toxicity.

Continued chronic toxicity monitoring is appropriate for ongoing evaluation and for analysis in the next reissuance of the permit. EPA proposes that Tesoro conduct chronic whole effluent toxicity during the permit term at a lower frequency (annual), with a larval development test (using mussels or oysters) and a fertilization test (using urchins or sand dollars). These data will be analyzed to determine whether any changes in toxicity are occurring over the long term.

For acute toxicity, the 1991 permit required that there be no acute toxicity in the final effluent. At times, as indicated in the table above, Tesoro's effluent tests showed acute effects to juvenile salmonids in undiluted effluent (i.e., the LC50 was less than 100% effluent). After the most recent test showing toxicity, Tesoro reviewed refinery operations during this period and discovered leaks in the ammonia removal equipment (sour water stripper). After making repairs to the system, acute toxicity has not recurred in follow-up tests. Based on the effectiveness of the 1991 permit requirements to identify and respond to toxicity problems, EPA proposes to retain similar requirements for acute toxicity in the reissued permit. EPA also proposes that Tesoro implement BMPs to minimize ammonia releases from the sour water stripper.

C. Sediment Monitoring

In the first and fourth year of the permit term, the permit requires Tesoro to conduct ambient sediment monitoring in the outfall vicinity. The objective of the monitoring program is to determine whether the contaminants discharged by the Tesoro Refinery persist above natural levels in sediments to significantly adverse levels.

EPA proposes monitoring for the following parameters:

- i) aliphatic hydrocarbons
- ii) polycyclic aromatic hydrocarbons (PAH)
- iii) total organic carbon (TOC)
- iv) particle grain size (PGS)
- v) trace metals

The permit does not prescribe specific locations for sampling. Tesoro would be required to evaluate the conditions in the outfall vicinity and

select monitoring locations that meet the objective of this monitoring and submit the proposed locations in the Quality Assurance Plan.

D. Quality Assurance Plan

Federal regulations at 40 CFR 122.41(e) require permittees to properly operate and maintain their facilities, including “adequate laboratory controls and appropriate quality assurance procedures.” To implement this requirement, the draft permit requires Tesoro to develop a Quality Assurance Plan. The Quality Assurance Plan will contain Tesoro’s operating procedures for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The draft permit requires Tesoro to submit the Quality Assurance Plan to EPA and ADEC for review within 60 days of effective date of the permit.

F. Representative Sampling

The draft permit has expanded the requirement in the federal regulations regarding representative sampling (40 CFR 122.41[j]). This provision now specifically requires sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit. This provision is included in the draft permit because routine monitoring could miss permit violations and/or water quality standards exceedences due to bypasses, spills, or non-routine discharges. This requirement directs Tesoro to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent.

VII. BEST MANAGEMENT PRACTICES

Best management practices (BMPs) are measures that are intended to prevent or minimize the generation and the potential for the release of pollutants from industrial facilities to the waters of the United States through normal operations and ancillary activities. Each facility component or system will be examined for its potential for causing a release of significant amounts of pollutants to waters of the United States due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc. The examination shall include all normal operations and ancillary activities including wastewater treatment, material storage areas, storm water, in-plant transfer, material handling areas, loading operations, spillage or leaks, sludge and waste disposal, and drainage from raw material storage.

Tesoro currently operates under a number of safety and spill prevention protocols, including the Tesoro Refinery Spill Prevention Control and Countermeasure (SPCC) Plan, Tesoro Refinery State Contingency Plan (9724-

CP-6188), and Tesoro Refinery Safety Manual. These will be incorporated into the NPDES plan by reference.

In addition, the proposed permit requires Tesoro to develop and implement specific BMPs to minimize releases of ammonia from the sour water stripper to the refinery wastewater collection system (see discussion above regarding ammonia and whole effluent toxicity).

VIII. OTHER PERMIT CONDITIONS

In addition to facility-specific requirements, sections III, IV, and V of the draft permit contains “boilerplate” requirements. Boilerplate is standard regulatory language that applies to all permittees and must be included in NPDES permits. Because boilerplate requirements are based on regulations, they cannot be challenged in the context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and general requirements.

IX. OTHER LEGAL REQUIREMENTS AND CONSIDERATIONS

A. Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. The EPA has tentatively determined that the discharge has **no effect** on the listed threatened and endangered species identified below.

EPA requested lists of threatened and endangered species from the NMFS and the USFWS in letters dated November 4, 1999. In a letter dated November 16, 1999 the USFWS indicated that the Steller’s eider (*Polysticta stelleri*) and the Short-tailed albatross (*Phoebastria albatrus*) may occur within the discharge area. The Steller’s eider breeds in the arctic coastal plain in northern Alaska. The eider nests in the central arctic coastal plain, primarily near Barrow. The majority of the eiders winter from the eastern Aleutian Islands to the southern portion of Cook Inlet (whereas the discharge is mid-way up the Inlet) in shallow, near-shore marine waters. Available documentation on the albatross indicates that it is highly unlikely it ever bred in Alaska and that during the non-breeding season (summer) the albatross is usually sighted in the northern Gulf of Alaska, Aleutian Islands, and Bering Sea.

In a letter dated February 14, 2000 the NMFS indicated that the Steller (northern) sea lion (*Eumetopias jubatus*) occurs in the area of discharge. In addition, the Fin

whale, and the Humpback whale are occasionally found in lower Cook Inlet waters. The Steller sea lions are sighted infrequently in the Cook Inlet area and only during open water seasons, associated with salmon returns. No documented sea lion rookeries or haulout sites occur near the discharge with the nearest rookeries located in the Gulf of Alaska. Critical habitat for the sea lion, Fin whale, and Humpback whale has not been identified within Cook Inlet or the discharge location. The NMFS has stated that given the distribution and limited seasonal occurrence in the Inlet of the mammals, none of the ESA listed species should be adversely impacted by the Tesoro discharge.

The NMFS also indicated that the Beluga whale (*Delphinapterus leucas*) is presently listed as candidate species and is proposed as depleted stock under the Marine Mammal Protection Act. Although the Beluga's are not yet protected under the ESA, the NMFS feels it is a species of special concern and several Cook Inlet tribes have expressed concern about the effects of Cook Inlet dischargers on the Belugas (see discussion under Tribal Consultation, below). Therefore, EPA has conducted an evaluation of the available information on both Belugas and the Tesoro discharge. Based on this evaluation, EPA has tentatively determined that the discharge is **not likely to adversely effect** the Belugas. EPA is consulting informally with NMFS and the Cook Inlet tribes regarding this determination.

B. Tribal Consultation

EPA has developed the proposed permit after government-to-government consultation with Tribes in the Kenai area. In particular, the Tribes have expressed concerns about the potential impact of wastewater discharges on Beluga whale populations in Cook Inlet. To address tribal questions and concerns, EPA has reviewed available information about the Tesoro discharge and life history of Beluga whales. Based on this review, EPA has determined that the Tesoro discharge is not likely to adversely affect Beluga whale populations. Copies of the assessment report on Beluga whales are available upon request (see contact information above).

After consultation with the Tribes, EPA proposes to require Tesoro to provide copies of all monitoring reports to a tribal information repository to be coordinated by the Native Village of Salsalamatof.

C. Essential Fish Habitat

The Magnuson-Stevens Act and implementing regulations (January 21, 1999) require federal agencies to consult with NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated Essential Fish Habitat (EFH) as defined by the Act. The EFH regulations define an *adverse effect* as any impact which reduces quality and/or

quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. EPA has prepared an EFH analysis in Appendix D.

EPA is providing NMFS with copies of the draft permit and fact sheet during the public notice period. Comments received from NMFS regarding EFH will be considered prior to reissuance of this permit.

D. State Certification

Section 401 of the Clean Water Act requires EPA to seek certification from the State that the permit is adequate to meet State water quality standards before issuing a final permit. The regulations allow for the State to stipulate more stringent conditions in the permit, if the certification cites the Clean Water Act or State law references upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of State law.

Part of the State's certification is authorization of mixing zones. Tesoro has submitted applications for mixing zones for achievement of aquatic life criteria in Cook Inlet. On January 6, 1999, the Alaska Department of Environmental Conservation (ADEC) provided EPA with a proposed mixing zone for chronic criteria for this facility. This proposed mixing zone would extend 33 meters from the outfall terminus, and provide a dilution of 56:1. On February 10, 2000, ADEC provided a proposed mixing zone for acute criteria that would extend 4.1 meters from the outfall terminus and provide a dilution of 17:1.

The draft permit has been sent to the State to begin the final certification process. If the State authorizes different mixing zones in its final certification, EPA will recalculate the effluent limitations in the final permit based on the dilution available in the final mixing zones. If the State does not certify mixing zones, EPA will recalculate the permit limitations based on meeting water quality standards at the point of discharge (zero dilution).

E. Coastal Zone Management Act (CZMA)

The state of Alaska will be reviewing this permit to determine consistency with the Coastal Zone Management Act.

F. Permit Term

This permit shall expire five years from its effective date.

REFERENCES

EPA 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. March 1991. EPA/505/2-90-001.

EPA 1989. *Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks*. Office of Water Enforcement and Permits, Office of Underground Storage Tanks. June 1989.

EPA 1996. *Preliminary Data Summary for the Petroleum Refining Category*. Office of Water. July 1996. EPA/821/R/96/015.

EPA 2000. *The Cook Inlet Beluga Whale, Its Life Cycle, and Potential Impacts from Five NPDES Dischargers*. Prepared for EPA by Science Applications International Corporation. February 2000.

Mineral Management Service 1995. *Current Water Quality in Cook Inlet, Alaska*. Prepared for MMS by the University of Alaska, Anchorage.

APPENDIX A: Tesoro Facility Map

APPENDIX B: Tesoro Waste Streams and Treatment Processes

Table B-1 shows the waste streams discharged from the Tesoro facility, average flowrate, and the wastewater treatment process applied to each waste stream according to the permit application. The first group of waste streams is treated by oil/water separation (API), dissolved air flotation (DAF), rotating biological contactors (RBCs), and the final aerated lagoon. The second group is routed directly to the final aerated lagoon prior to discharge. The contaminated groundwater is pumped through an air stripping tower before routing to the final aerated lagoon.

Table B-1

Waste stream	Average Flow ¹ (GPD)	Treatment
Vacuum Unit	25	API, DAF, RBC, Aerated Lagoon, Filtration ⁵
Crude Topping	145,000	
Reformer/LPG/Prip	21	
Hydrocracker/Hydrogen/Sulfur	23,600	
Stormwater Runoff	4,600	
Tank Farm	8,400	
Cooling Tower	37,000	Aerated Lagoon, Filtration ⁵
Utilities	38,100	
Catalyst Regeneration	See Note 4	Activated Carbon (starting in 2000), Aerated Lagoon, Filtration ⁵
Contaminated Groundwater	1,080,000 ²	Air Stripping, Aerated Lagoon, Filtration ⁵
Total : Final Effluent	1,260,000 ³	NA
Notes		
1	All values from 1995 application for permit reissuance, except regeneration catalyst waste stream (see Note 4).	
2	Groundwater flow is projected	
3	Final effluent value is less than sum of flows due to an accounting for losses to sludge disposal and evaporation	
4	This waste stream occurs approximately once per year over a period of several days. It is a batch process, with average discharges of approximately 1,000 gallons per day.	
5	Filtration treatment is operated in the summer months to reduce TSS level	

APPENDIX C: Basis for Effluent Limitations

I. Statutory and Regulatory Basis for Limits

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates the discharge(s) with respect to these sections of the Clean Water Act and the relevant National Pollutant Discharge Elimination System (NPDES) regulations to determine which conditions to include in the draft permit.

In general, EPA first determines which technology-based limits must be incorporated into the permit. EPA then evaluates the effluent quality expected to result from these controls, to see if it could result in any exceedences of the water quality standards in the receiving water. If exceedences could occur, EPA must include water quality-based limits in the permit. The proposed permit limits will reflect whichever requirements (technology-based or water quality-based) are more stringent. This Appendix discusses the technology-based and water quality-based evaluations for Tesoro's discharge.

II. Technology-based Evaluation

Section 301(b)(2) of the Clean Water Act requires technology-based controls on effluents. This section of the Clean Water Act requires that, by March 31, 1989, all permits contain effluent limitations which: (1) control toxic pollutants and nonconventional pollutants through the use of "best available technology economically achievable" (BAT), and (2) represent "best conventional pollutant control technology" (BCT) for conventional pollutants. In no case may BCT or BAT be less stringent than "best practicable control technology currently available" (BPT), which is a minimum level of control required by section 301(b)(1)(A) the Clean Water Act.

EPA develops technology-based effluent guidelines for a number of major industries in the United States, including petroleum refining. EPA Region 10 conducted the original technology evaluation for the Tesoro facility in the 1970's, before development of the national guidelines. Thus, the effluent limitations for the facility were developed using Region 10's Best Professional Judgment (BPJ) as is required when no guideline covers the activity.

In the last permit reissuance, the permit reflected (1) a facility expansion, and (2) the national guidelines. The original BPJ limitations were maintained on the original production levels (49,183 bbl/day), and the national guideline limitations were applied to the increment of production added in the expansion (up to 75,000 bbl/day).

In this reissuance, a similar calculation has been made using a combination of the original BPJ limits and the national guideline limits. The calculation has again been refined, this time accounting for (1) actual production levels versus rated capacity, and (2) process modifications since the last reissuance. The results of the calculation are listed in Table 1 of this fact sheet. The detailed calculations are documented in a separate technical memorandum which is available to the public for review on request (see contact information at the beginning of this fact sheet).

EPA proposes to deviate from the above calculation approach for total suspended solids (TSS) limits. The Tesoro facility has experienced problems achieving the TSS limits in the 1991 permit. Based on available information, the problem is characterized as a seasonal increase in TSS levels due to algae blooms in the aerated treatment ponds. Tesoro has monitored chlorophyll-a in the discharge to confirm the relationship between algal growth and effluent TSS concentrations, while the seasonality of the problem is depicted in the monthly monitoring reports for TSS in the last several years.

In the years since the BPJ limits were developed, Tesoro has changed some of its refinery and treatment system components, but the effects of these changes on TSS levels are not known. For example, rotating biological contactors (RBCs) were added to the treatment process in the mid-1980s, and this change may or may not have affected biological growth within the aerated lagoons. Changes to refinery processes and operations may also have changed the dynamics for algal growth in the lagoons. Given the passage of time, EPA cannot ascertain whether the original BPJ analysis considered potential algal growth in the ponds.

In 1998, Tesoro added a filtration unit to the treatment process to provide additional removal of TSS from its wastewater. While it achieved the 1991 limits, the filtration unit did not achieve the monthly average TSS limits that would apply in the new permit (see table below).

Parameter	Monthly Average Discharge (July 1998)	1991 AML	Newly Calculated AML	Daily Maximum Discharge (July 1998)	1991 DML	Newly Calculated DML
TSS	159	166	141	223	261	223

Based on Tesoro's new information and the above considerations, EPA proposes to retain the 1991 TSS limits in the reissued permit rather than the newly calculated (and more stringent) limits based on actual production. This proposal is consistent with the anti-backsliding provisions of the NPDES regulations (40 CFR 122.44(l)), which allow less stringent limits in reissued BPJ-based permits when a facility has installed appropriate treatment technology but still cannot achieve the limits. Since the facility

performance in the past 2 summers indicates that the 1991 TSS limits were achieved, EPA proposes to retain these limitations.

III. Water Quality-based Evaluation

In addition to the technology-based limits discussed above, EPA evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the Clean Water Act. This section requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977.

The regulations at 40 CFR 122.44(d) implement section 301(b)(1)(C) of the Clean Water Act. These regulations require that NPDES permits include limits for all pollutants or parameters which “are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.” The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

In determining whether water quality-based limits are needed and developing those limits when necessary, EPA uses the approach outlined below:

1. Determine the appropriate water quality criterion
2. Determine whether there is “reasonable potential” to exceed the criterion outside any mixing zone (or at “end-of-pipe” if no mixing zone is authorized)
3. If there is “reasonable potential”, develop a wasteload allocation (WLA)
4. Develop effluent limitation based on WLA

The following sections provide a detailed discussion of each step. Appendix D provides an example calculation to illustrate how these steps are implemented.

A. Water Quality Criteria

The first step in developing water quality-based limits is to determine the applicable water quality criteria. For Alaska, the State water quality standards are found at 18 AAC 70.

The applicable criteria are determined based on the beneficial uses of the receiving water. Beneficial uses for Cook Inlet are: water supply; water

recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

For any given pollutant, different uses may have different criteria. To protect all beneficial uses, the permit limits are based on the most stringent of the water quality criteria applicable to those uses (see Table C-5).

B. "Reasonable Potential" Evaluation

To determine if there is "reasonable potential" to cause or contribute to an exceedence of water quality criteria for a given pollutant, EPA estimates the maximum projected pollutant concentration at the mixing zone boundary (or at the end-of-pipe if no mixing zone is authorized). EPA then compares this estimate to the water quality criterion for that pollutant. If the estimated receiving water concentration exceeds the criterion, there is "reasonable potential" to exceed the criterion and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) to conduct this "reasonable potential" analysis.

The maximum projected pollutant concentration is determined using the following equation. It is calculated using the maximum projected effluent concentration, dilution (if a mixing zone is authorized), and the background pollutant concentration.

$$C_d = C_u + \frac{C_e - C_u}{D}$$

where,

C_d = downstream concentration (at the edge of the mixing zone)

C_u = upstream (ambient concentration)

C_e = maximum projected effluent concentration

D = dilution

Section 1 through 3 below discusses each of the factors used in the mass balance equation to calculate C_d . Section 4 provides EPA's conclusions from the "reasonable potential" calculation for Tesoro's discharge.

1. Ambient Concentration

The ambient concentration in the mass balance equation is based on a reasonable worst-case estimate of the background pollutant

concentration in the receiving water. EPA does not have background data for the Nikiski area and used a default of zero for the calculation.

2. Effluent Concentration

The maximum projected effluent concentration in the mass balance equation is represented by a 99th percentile value, calculated using the statistical approach recommended in the TSD. The 99th percentile effluent concentration is calculated by multiplying the maximum reported effluent concentration by a reasonable potential multiplier. The reasonable potential multiplier accounts for uncertainty in the data. The multiplier decreases as the available data points increases. Variability is measured by the coefficient of variation (CV) of the data. When there are not enough data to reliably determine a CV, the TSD recommends using 0.6 as a default value. A partial listing of reasonable potential multipliers can be found in Table 3-1 of the TSD. EPA evaluated the effluent quality information supplied by Tesoro in its NPDES permit application to determine the projected maximum effluent concentrations.

3. Dilution

The dilution used in the mass balance equation is based on modeling projections that estimate the degree of mixing that occurs when a particular discharge enters a receiving water. A number of established models are available to model the discharge "plume". The amount of initial mixing occurring in the plume is driven by the momentum of the discharge. Thus, the model calculations are dependent on physical features of the discharge pipe (diameter, flowrate, depth, etc.) and receiving water (depth, salinity, currents, etc.).

On September 29, 1998, Tesoro submitted a chronic mixing zone evaluation and application to ADEC and EPA (Parametrix, 1998). In that submittal, Tesoro requested a mixing zone radius of 33 meters around the outfall, which would provide a dilution of 56:1 for the final discharge. On January 6, 1999, ADEC provided EPA with a preliminary certification for Tesoro's permit, indicating that the State would propose to authorize the mixing zone and dilution requested by Tesoro.

On January 31, 2000, Tesoro submitted an acute mixing zone evaluation and application to ADEC and EPA (Parametrix, 1998). In that submittal, Tesoro requested an acute mixing zone for ammonia with a radius of 17 meters around the outfall, which would provide a dilution of 44:1 for the final discharge. On February 10, 2000, ADEC provided EPA with a

preliminary certification indicating that the State would propose to authorize a mixing zone of 4.1 meters, with a dilution of 17:1.

If ADEC authorizes different sized mixing zones in its final certification, EPA will recalculate the reasonable potential and effluent limits based on the final mixing zones.

Reasonable Potential Determination for the Tesoro facility

The only pollutant detected in the Tesoro effluent that shows a reasonable potential to exceed the applicable water quality criteria outside the proposed mixing zone is ammonia. The reasonable potential calculations for ammonia are included in Appendix D.

D. Wasteload Allocation Development

Once the need for a permit limit is established, the first step in developing the limit is developing a wasteload allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that a facility may discharge without causing or contributing to an exceedence of water quality standards in the receiving water.

Where the State authorizes a mixing zone for a discharge, the WLA is calculated as a mass balance, based on the available dilution, background concentrations of the pollutant(s), and the water quality criteria. The mass balance equation is the same as that used to calculate reasonable potential, with the acute or chronic criterion substituted for C_d and the WLA substituted for C_e .

Because the different criteria (acute aquatic life, chronic aquatic life, human health) apply over different time frames and may have different mixing zones, it is not possible to compare them directly to determine which criterion results in the most stringent limits. For example, the acute criteria are applied as one-hour averages and may have a smaller mixing zone, while the chronic criteria are applied as four-day averages and may have a larger mixing zone. To allow for comparison, each criterion is statistically converted to a long-term average WLA. This conversion is dependent upon the coefficient of variation (CV) of the effluent data and the probability basis used. The probability basis corresponds to the percentile of the estimated concentration. EPA uses a 99th percentile probability basis for calculating a long-term average, as recommended in the TSD. Based on this analysis, the most

stringent long-term average WLA is used to calculate the permit limits. Section D below discussed the permit limit derivation procedure.

D. Permit Limit Derivation

Once the WLA has been developed, EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain daily maximum and monthly average permit limits. This approach takes into account effluent variability (through the coefficient of variation), sampling frequency, and the difference in time frames between the monthly average and daily maximum limits.

The daily maximum limit is based on the CV of the data and the probability basis, while the monthly average limit is dependent on these two variables and the monitoring frequency. As recommended in the TSD, EPA used a probability basis of 95 percent for monthly average limit calculation and 99 percent for the daily maximum limit calculation. EPA assumed a CV of 0.6 for both monthly average and daily maximum calculations. Appendix D contains an example permit limit derivation.

E. Antidegradation

In addition to establishing water quality-based limitations for pollutants that could cause or contribute to exceedences of numeric or narrative criteria, EPA must consider the State's antidegradation policy. This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard. For high quality waters, antidegradation requires that, before any degradation is authorized, the State must find that allowing lower water quality is necessary to accommodate important economic or social development. This means that, if water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation or if the State makes the determination that it is necessary.

EPA has calculated new technology-based limitations based on actual production rates and process changes during the last permit term. Most of the technology-based limits are more restrictive than the previous permit limits. However, limits for three pollutants (phenolic compounds, total chromium, and hexavalent chromium) would increase on the basis of the new calculations. However, based on anti-degradation policy, the draft permit contains limits identical to the previous permit. If the state of Alaska makes an anti-degradation determination that allows for increases in the discharge

of these pollutants, EPA will revise the permit accordingly prior to its finalization.

F. Discussion of Specific Pollutants

Ammonia

Ammonia is the only pollutant indicating a reasonable potential to exceed water quality standards outside the proposed mixing zone. The State of Alaska recently adopted EPA's national ammonia criteria for protection of marine biota. The criteria are dependent on salinity, pH, and temperature. Ammonia toxicity is greatest when temperature and pH are high and salinity is low. EPA has assumed values for temperature (15E), pH (8.2 std units), and salinity (30 g/kg) in Cook Inlet that represent worst case conditions for ammonia toxicity in the outfall vicinity. The ammonia criteria for these conditions are 6.7 mg/L (acute) and 1.0 mg/l (chronic).

The calculations for ammonia permit limits are included in Appendix D.

Hydrocarbons

The limit for total aromatic hydrocarbons in the 1991 permit has been removed based on a lack of reasonable potential to exceed the water quality criterion.

Dioxin

Dioxin is not generated in the routine daily operations of the Tesoro refinery. Approximately once a year, a catalyst must be regenerated as part of normal maintenance of the refinery. A combustion process is used, and dioxins are known to be formed during this regeneration process. EPA required monitoring for dioxin (2,3,7,8-TCDD) in the 1991 permit, and it has been detected in samples of the batch wastewater from this process at concentrations up to 299 pg/l (picograms per liter).

Because Tesoro's amended permit application indicates that activated carbon treatment will be employed on the catalyst regeneration waste stream, the proposed permit conditions are predicated on this level of treatment. This treatment process is expected to bring dioxin levels in this waste stream to below-detection and eliminate any potential for exceedances of the criterion at end-of-pipe. The proposed permit requires Tesoro to provide written confirmation that the treatment process is installed and operational prior to the next catalyst regeneration. This waste stream will continue to be monitored for dioxin during for the permit term.

pH

EPA proposes to retain the current allowable range for pH of 6.5 to 9.0 standard units. The Alaska water quality standard is 8.5 standard units maximum. The technology-based limit of 9.0 for refineries, applied at end-of-pipe, is expected to achieve the state standard within the mixing zone boundaries.

APPENDIX D: Ammonia Limit Calculations

Step 1: Determine the appropriate criteria

For ammonia, the most stringent criteria are the EPA's national ammonia criteria for protection of marine biota, which are adopted into the Alaska water quality standards. The criteria are dependent on salinity, pH, and temperature. Ammonia toxicity is greatest when temperature and pH are high and salinity is low. EPA has assumed values for temperature (15E), pH (8.2 std units), and salinity (30 g/kg) in Cook Inlet that represent worst case conditions for ammonia toxicity in the outfall vicinity. The ammonia criteria for these conditions are 6.7 mg/L (acute) and 1.0 mg/l (chronic).

Step 2: Determine whether there is "reasonable potential" to exceed the criteria

2A. Determine the "reasonable potential" multiplier

The "reasonable potential" multiplier is based on the coefficient of variation (CV) of the data and the number of data points. Tesoro has 128 data points for ammonia, with a calculated CV of 0.84. Using the table in section 3.3.2. of the TSD, the "reasonable potential" multiplier (RPM) for the ammonia dataset is 2.9.

2B. Calculate the concentration of the pollutant at the edge of the mixing zone

There is reasonable potential to exceed criteria if the maximum projected concentration of the pollutant at the edge of any mixing zone exceeds the criterion. The maximum projected concentration for each criterion (acute and chronic) is calculated from the following equation (assuming background is zero):

$$C_{ba} = C_e / D_a \quad \text{for acute}$$

and

$$C_{bc} = C_e / D_c \quad \text{for chronic}$$

where,

C_{ba} = concentration at the acute mixing zone boundary

C_{bc} = concentration at the chronic mixing zone boundary

D_a = dilution at acute mixing zone boundary = 17
 D_c = dilution at chronic mixing zone boundary = 56
 C_e = maximum projected effluent concentration
 = maximum reported effluent concentration * reasonable potential
 = 26 mg/l * 2.9
 = 75.4 mg/l

$$C_{ba} = 75.4/17 = 4.4 \text{ mg/l Ammonia}$$

This is the maximum projected ammonia concentration estimated to occur at edge of the acute mixing zone boundary (after dilution of 17:1)

The acute criterion is 6.7 mg/l

$$C_{bc} = 75.4/56 = 1.3 \text{ mg/l Ammonia}$$

This is the maximum projected ammonia concentration estimated to occur at edge of the chronic mixing zone boundary (after dilution of 56:1)

The chronic criterion is 1.0 mg/l

If either of these values are greater than the associated acute or chronic criterion, a limit must be included in the permit.

Step 3: Calculate the wasteload allocations

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentrations of the pollutant at the edge of the mixing zones. However, in this step, the dilution is multiplied by the water quality criterion to determine the highest end-of-pipe concentration that would meet the criterion at the mixing zone boundary:

For chronic,

$$\begin{aligned}
 WLA_c &= D_c * (CCC) \\
 &= 56 * (1.0)
 \end{aligned}$$

$$WLA_c = 56.0 \text{ mg/l}$$

For acute,

$$WLA_a = D_a * (CCC)$$

$$= 17 * (6.7)$$

$$\mathbf{WLA_a = 114 \text{ mg/l}}$$

The WLAs are converted to long-term average concentrations using the following equations from EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

For chronic,

$$LTA_c = WLA_c * \exp[0.5F_4^2 - zF_4]$$

where,

$$F_4^2 = \ln(CV^2/4 + 1)$$

$$z = 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis}$$

$$CV = 0.84$$

$$\mathbf{LTA_c = 23.8 \text{ mg/l}}$$

For acute

$$LTA_a = WLA_a * \exp[0.5F_4^2 - zF_4]$$

where,

$$F_4^2 = \ln(CV^2/4 + 1)$$

$$z = 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis}$$

$$CV = 0.84$$

$$\mathbf{LTA_a = 27.2 \text{ mg/l}}$$

The LTAs are compared and the most stringent (in this case the chronic LTA) is used to develop the daily maximum and monthly average permit limits.

Step 4: Derive the maximum daily (MDL) and average monthly (AML) permit limits

Using the TSD equations, the MDL and AML permit limits are calculated as follows:

$$MDL = LTA_c * \exp[zF - 0.5F^2]$$

where:

$$F^2 = \ln(CV^2 + 1)$$

$$z = 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis}$$

$$CV = 0.84$$

$$\mathbf{MDL = 100 \text{ mg/l}}$$

$$AML = LTA_c * \exp[zF - 0.5F^2]$$

where:

$$F^2 = \ln(CV^2/n + 1)$$

$$z = 1.645 \text{ for } 95^{\text{th}} \text{ percentile probability basis}$$

$$CV = 0.84$$

$$n = \text{number of sampling events required per month} = 4$$

$$\mathbf{AML = 43 \text{ mg/l}}$$

APPENDIX E: Basis for Remediation Wastewater Limit on Benzene

There are no effluent guidelines for discharges from groundwater recovery operations. Therefore, the technology-based limits for this operation are based on Best Professional Judgment (BPJ). The limits proposed in the permit for benzene are based on current performance of the system under another regulatory permit (see below) and EPA's "Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks" (June 1989). This document provides recommended limitations based on the use of air stripping technology to remove petroleum constituents. EPA found that this technology can remove 99.5 percent of the hydrocarbons in contaminated waters.

The proposed permit includes a daily maximum effluent limitation of 5 ug/l benzene. EPA notes that compliance with an identical benzene limit is already required for ongoing discharges to groundwater under Tesoro's post-closure permit (AKD 04867 9682), issued by EPA and the Alaska Department of Environmental Conservation pursuant to the Resource Conservation and Recovery Act (RCRA). Tesoro has applied to discharge the same wastewater to Cook Inlet after commingling with wastewaters from refinery operations. The benzene limit is applied to the treated effluent from the groundwater treatment system, prior to its entering the refinery wastewater system (labeled "Outfall 001A) in the permit).

As discussed in Appendix C, EPA calculates both water quality-based and technology-based limitations for a facility, with the more stringent limitation applying to the discharge. In addition to the above technology-based review, the water quality-based limitations for benzene in the final discharge (consisting of treated refinery and remediation wastewaters) were also evaluated. EPA determined that the treated final discharge is expected to meet water quality standards at the end-of-pipe. Therefore, while a technology-based limit is applied to the remediation waste stream on a Best Professional Judgment basis, additional benzene limitations for the final discharge are not necessary.

APPENDIX F: Essential Fish Habitat (EFH) Assessment

Pursuant to the requirements for EFH assessments, this appendix contains the following information:

- (1) Listing of EFH Species in the Facility Area
- (2) Description of the Facility and Discharge Location
- (3) EPA's Evaluation of Potential Effects to EFH
- (4) Tentative EFH Determination

Listing of EFH Species in the Facility Area

Cook Inlet in the vicinity of the Tesoro facility is designated as essential fish habitat for Pacific cod, and Pink, Chum, Sockeye, Chinook, and Coho salmon (Habitat Assessment Reports for Essential Fish Habitat, National Marine Fisheries Service, 1998).

Description of the Facility and Discharge Location

The activities and sources of wastewater at the Tesoro facility are described in detail in Part II ("Facility Activity") of this fact sheet (Pg. 5). The location and physical features of receiving water in the outfall location are described in Part III ("Receiving Water").

EPA's Evaluation of Potential Effects to EFH

Water quality is an important component of aquatic life habitat. NPDES permits are developed to protect water quality in accordance with state water quality standards. A state's water quality standards are composed of use classifications, and numeric and/or narrative water quality criteria. The use classification system designates the beneficial uses that each water body is expected to achieve (such as aquatic life, contact recreation, etc.). The numeric and/or narrative water quality criteria are the criteria deemed necessary, by the State, to support the beneficial use classification of each water body.

EPA and states evaluate toxicological information from a wide range of species and life stages in establishing water quality criteria for the protection of aquatic life. For example, the criteria for ammonia in saltwater adopted by the State of Alaska are based on bioassays (predominantly acute tests) of 21 marine species in 18 genera.

NPDES permit writers evaluate a wide range of chemical constituents (as well as whole effluent toxicity testing results) to identify pollutants of concern, from a discharge, with respect to the criteria values. When a facility discharges a pollutant at a level that has a potential to exceed the water quality criteria, permit limits are established to prevent exceedences of the criteria in the receiving water (outside any authorized mixing zone).

The development of permit limits for an NPDES discharger includes the basic elements of ecological risk analysis. The underlying technical process leading to NPDES permit requirements incorporates the following elements of risk analysis :

Effluent Characterization

Characterization of effluent constituents using information from a variety of sources, including:

- Priority pollutant scans
- Permit compliance monitoring
- Whole effluent toxicity testing
- Effluent variability
- Quality assurance evaluations

Identification of Pollutants of Concern and Threshold Concentrations

Identification of pollutants of concern, including:

- Pollutants with aquatic life criteria in the Alaska Water Quality Standards
- Other pollutants of concern based on available information

Exposure and Wasteload Allocation

Analysis of the transport of pollutants near the discharge point with respect to the following:

- Mixing zone policies in the Alaska Water Quality Standards
- Dilution modeling and analysis
- Exposure considerations (e.g., prevention of lethality to passing organisms)
- Consideration of multiple sources and natural background concentrations
- Total Maximum Daily Loads (where appropriate)

Statistical Evaluation for Permit Limit Development

Calculation of permit limits using statistical procedures addressing the following:

- Effluent variability and non-continuous sampling
- Fate/transport variability
- Duration and frequency thresholds identified in the water quality criteria

Monitoring Programs

Development of monitoring requirements, including:

- Compliance monitoring of the effluent

Ambient water column monitoring
Ambient sediment monitoring

Additional information on EPA's approach to aquatic life protection is outlined in detail in the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001, March 1991).

EPA recognizes that wastewater discharges can have physical and/or chemical effects on sediment habitat. For facilities with pollutant discharges that could impact sediments, EPA can require the permittee to sample sediments in the outfall area and analyze them for pollutants of concern. In the case of the Tesoro permit, the facility has not sampled sediments in the outfall area to date. EPA proposes that the facility conduct sediment monitoring in the first and fourth year of the permit.

Tentative EFH Determination

The proposed permit has been developed to protect aquatic life species in Cook Inlet in accordance with the Alaska water quality standards. The protection of aquatic life should protect both the managed EFH species and their prey. EPA has tentatively determined that issuance of this permit is not likely to adversely affect any EFH in the vicinity of the discharge. EPA will provide NMFS with copies of the draft permit and fact sheet during the public notice period. Any recommendations received from NMFS regarding EFH will be considered prior to reissuance of this permit.